

RECEIVED  
CENTRAL FAX CENTER  
DEC 05 2006

IN THE CLAIMS

Claims 1-39 (canceled)

40. (currently amended) An electrosterically stabilized aqueous polyurethane ~~dispersion resin having an improved profile of properties~~, prepared by the process of:

- a) preparing a hydrophilic and solvent-free macromonomer (A)(ii) with monomodal molecular mass distribution, wherein
  - a<sub>1</sub>) reacting 50 to 100 parts by weight of a hydrophilic alkyl- and/or arylpolyalkylene glycol (A)(i) having a primary and/or secondary and/or tertiary hydroxyl group which is reactive toward isocyanate groups and having a molecular mass of 250 to 5000 daltons with 1 to 100 parts by weight of a polyisocyanate (B)(i), comprising at least one diisocyanate, polyisocyanate, polyisocyanate derivative or polyisocyanate homolog having two or more (cyclo)aliphatic or aromatic isocyanate groups of identical or different reactivity, optionally in the presence of a catalyst,
  - a<sub>2</sub>) reacting the preadduct from stage a<sub>1</sub>) completely with 0.5 to 200 parts by weight of a compound (C) having two or more primary and/or secondary amino groups and/or hydroxyl groups which are reactive toward isocyanate groups and having a molecular mass of 50 to 500 daltons, and also
- b) by preparing a polyurethane dispersion, wherein
  - b<sub>1</sub>) reacting 2 to 50 parts by weight of the hydrophilic and solvent-free macromonomer (A)(ii) with monomodal molecular mass distribution, having two or more hydroxyl groups which are reactive toward isocyanate groups and having a molecular mass of 500 to 5500 daltons, reacting with 25 to 250 parts by weight of a polyisocyanate component (B)(ii) consisting of at least one polyisocyanate,

polyisocyanate derivative or polyisocyanate homolog having two or more (cyclo)aliphatic or aromatic isocyanate groups, optionally with the addition of 0 to 50 parts by weight of a solvent component (D) and optionally in the presence of a catalyst,

b<sub>2</sub>) reacting the polyurethane preadduct from stage b<sub>1</sub>) with 50 to 100 parts by weight of a polymeric polyol (A)(iii) having two or more hydroxyl groups which are reactive toward isocyanate groups and having a molecular mass of 500 to 5000 daltons

and optionally

with 0.5 to 10 parts by weight of a low molecular mass polyol component (A)(iv) having 2 or more hydroxyl groups and a molecular weight of 50 to 499 daltons, optionally in the presence of a catalyst,

b<sub>3</sub>) reacting the polyurethane preadduct from stage b<sub>2</sub>) with 2 to 20 parts by weight of a low molecular mass, anionically modifiable polyol component (A)(v) having one, two or more hydroxyl groups which are reactive toward isocyanate groups and having one or more inert carboxylic acid and/or sulfonic acid groups, which can be converted with a base fully or partly into carboxylate and/or sulfonate groups respectively, or are already in the form of carboxylate and/or sulfonate groups, and having a molecular mass of 100 to 1000 daltons, optionally in the presence of a catalyst,

b<sub>4</sub>) admixing the polyurethane prepolymer from stage b<sub>3</sub>), before or during dispersion in water, for the purpose of full or partial neutralization of the acid groups, with 2 to 20 parts by weight of a neutralizing component (E),

b<sub>5</sub>) optionally neutralized polyurethane prepolymer from stage b<sub>4</sub>) in 50 to 1500 parts by weight of water, which optionally further contains 0 to 100 parts by weight of a formulating component (F), and finally

b<sub>6</sub>) reacting the partially neutralized polyurethane prepolymer dispersion from stage b<sub>5</sub>) is reacted with 3 to 60 parts by weight of a chain extender component (G) and also, subsequently or simultaneously, with 0 to 30 parts by weight of a chain stopper component (H).

41. (previously presented) The polyurethane dispersion of claim 40, wherein component (A)(i) comprises copolymers and/or random copolymers and/or block copolymers, composed of 90% to 10% by weight of ethylene oxide and 10% to 90% by weight of further alkylene oxides having 4 to 30 carbon atoms per alkylene oxide with a primary and/or secondary and/or tertiary hydroxyl group.

42. (previously presented) The polyurethane dispersion of claim 40, wherein component (A)(i) comprises a monofunctional alkylpoly(ethylene oxide-*co/ran*-alkylene oxide) and/or alkylpoly(ethylene oxide-*block*-alkylene oxide) and/or sodium sulfonatopropylpoly(ethylene oxide-*co/ran*-alkylene oxide) and/or sodium sulfonatopropylpoly(ethylene oxide-*block*-alkylene oxide) having a primary and/or secondary and/or tertiary hydroxyl group, composed of 90% to 10% by weight of ethylene oxide and 10% to 90% by weight of a further alkylene oxide.

43. (previously presented) The polyurethane dispersion of claim 40, wherein the alkylene oxide comprises propylene oxide, butylene oxide, dodecyl oxide,

25721767.1

isoamyl oxide, oxetane, substituted oxetanes,  $\alpha$ -pinene oxide, styrene oxide, tetrahydrofuran or further aliphatic or aromatic alkylene oxides having 4 to 30 carbon atoms per alkylene oxide.

44. (previously presented) The polyurethane dispersion of claim 40, wherein component (A)(i) comprises monofunctional polyalkylene glycols and component (B)(i) is an at least functional polyisocyanate.

45. (previously presented) The polyurethane dispersion of claim 40, wherein component (B)(i) comprises toluene 2,4-diisocyanate, isomer mixtures of toluene 2,4-diisocyanate and toluene 2,6-diisocyanate, or isomer mixtures of isophorone diisocyanate.

46. (previously presented) The polyurethane dispersion of claim 40, wherein component (C) comprises diethanolamine.

47. (previously presented) The polyurethane dispersion of claim 40, wherein component (A)(iii) is a linear and/or difunctional polyalkylene glycols having a molecular mass of 500 to 5000 daltons.

48. (previously presented) The polyurethane dispersion of claim 40, wherein component (A)(iii) comprises polypropylene glycols and/or hydrophobically modified block copolymers with ABA, BAB or  $(AB)_n$  structure, wherein A is polymer

segment having hydrophobizing properties and B is a polymer segment based on polypropylene oxide.

49. (previously presented) The polyurethane dispersion of claim 48, wherein the polymer segment A comprises polybutylene oxide, polydodecyl oxide, polyisoamyl oxide, polyoxetane, substituted polyoxetane, poly- $\alpha$ -pinene oxide, polystyrene oxide, polytetramethylene oxide, further aliphatic or aromatic polyoxyalkylenes having 4 to 30 carbon atoms per alkylene oxide,  $\alpha,\omega$ -polymethacrylatediols,  $\alpha,\omega$ -dihydroxyalkylpolydimethyl-siloxanes, macromonomers, telecheles or mixtures thereof.

50. (previously presented) The polyurethane dispersion of claim 40, wherein component (A)(v) is a bishydroxyalkanecarboxylic acid.

51. (previously presented) The polyurethane dispersion of claim 50, wherein said bishydroxyalkanecarboxylic acid is dimethylolpropionic acid.

52. (previously presented) The polyurethane dispersion of claim 40, wherein the NCO/OH equivalent ratio in stage a<sub>1</sub>) is set at 1.9 to 2.1 and the NCO/OH+NH equivalent ratio in stage a<sub>2</sub>) is set at 0.95 to 1.05.

53. (previously presented) The polyurethane dispersion of claim 40, wherein the NCO/OH equivalent ratio of components (A)(i), (A)(ii), (A)(iii), (A)(iv), (A)(v) and (B)(ii) in stage b) is set at a value of 1.25 to 2.5, preferably 1.4 to 2.0.

25721767.1

6

54. (previously presented) The polyurethane dispersion of claim 40, wherein the neutralizing component (E) is added in an amount such that the degree of neutralization, based on the free carboxylic acid and/or sulfonic acid groups of the polyurethane prepolymer, is 25 to 100 equivalent%.

55. (previously presented) The polyurethane dispersion of claim 40, wherein the chain extender component (G) is added in an amount such that the degree of chain extension, based on the free isocyanate groups of the polyurethane prepolymer, is 50 to 100 equivalent%.

56. (previously presented) The polyurethane dispersion of claim 40, wherein the chain stopper component (H) is added in an amount such that the degree of chain termination, based on the free isocyanate groups of the polyurethane prepolymer, is 0 to 50 equivalent%, preferably 20 to 30 equivalent%.

57. (previously presented) The polyurethane dispersion of claim 40, wherein the amount of ethylene oxide group in the polyurethane polymer formed from components (A), (B), (C), (E), (G) and (H) is 0.5% to 10% by weight, preferably 2% to 5% by weight.

58. (previously presented) The polyurethane dispersion of claim 40, wherein the polyurethane polymer formed from components (A), (B), (C), (E), (G) and (H) the amount of carboxylate and/or sulfonate groups is set at 5 to 25 meq·(100 g)<sup>-1</sup>, preferably at 10 to 20 meq·(100 g)<sup>-1</sup>, and the acid number at 5 to 30 meq KOH·g<sup>-1</sup>, preferably at 10 to 25 meq KOH·g<sup>-1</sup>.
59. (previously presented) The polyurethane dispersion of claim 40, wherein the solids content of polyurethane polymer composed of components (A), (B), (C), (E), (G) and (H) is set at 30% to 70% by weight, preferably 50% to 55% by weight, based on the total amount of the polyurethane dispersion.
60. (previously presented) The polyurethane dispersion of claim 40, wherein the average particle size of the micelles is 50 to 500 nm, preferably 100 to 400 nm.
61. (previously presented) The polyurethane dispersion of claim 40, wherein the average molar mass (number average) is 25,000 to 500,000 daltons.

62. (previously presented) A process for preparing an electrosterically stabilized polyurethane dispersion comprising

a) preparing a hydrophilic and solvent-free macromonomer (A)(ii) with monomodal molecular mass distribution by

a<sub>1</sub>) reacting 50 to 100 parts by weight of a hydrophilic alkyl- or arylpolyalkylene glycol (A)(i) with 1 to 100 parts by weight of a polyisocyanate component (B)(i), optionally in the presence of a catalyst, in the absence of solvents, the reaction conditions and the selectivities of components (A)(i) and (B)(i) being chosen such that only one isocyanate group of component (B)(i) reacts with component (A)(i), and subsequently

a<sub>2</sub>) reacting the uniform preadduct from stage a<sub>1</sub>) completely with 0.5 to 200 parts by weight of a compound (C) in the absence of solvents, the reaction conditions and the selectivity of component (C) being chosen such that only one reactive group of component (C) reacts with the free isocyanate group(s) of the preadduct,

b) the polyurethane dispersion is prepared by

b<sub>1</sub>) reacting 2 to 50 parts by weight of the hydrophilic and solvent-free macromonomer (A)(ii) with 25 to 250 parts by weight of the polyisocyanate component (B)(i), optionally in the presence of 0 to 50 parts by weight of a solvent component (D) and also of a catalyst,

b<sub>2</sub>) reacting the polyurethane preadduct from stage b<sub>1</sub>) with 50 to 100 parts by weight of a polymeric polyol (A)(iii) and optionally with 0.5 to 10 parts by weight of a low molecular mass polyol component (A)(iv), optionally in the presence of a catalyst,



b<sub>3</sub>) reacting the homogeneous polyurethane preadduct from stage b<sub>2</sub>) with 2 to 20 parts by weight of a polyol component (A)(v), optionally in the presence of a catalyst,

b<sub>4</sub>) admixing the homogeneous polyurethane prepolymer from stage b<sub>3</sub>), before or during dispersion in 50 to 1500 parts by weight of water, with 2 to 20 parts by weight of a neutralizing component (E),

b<sub>5</sub>) dispersing the optionally (partially) neutralized polyurethane prepolymer from stage b<sub>4</sub>) in 50 to 1500 parts by weight of water, which optionally further contains 0 to 100 parts by weight of a formulating component (F), and finally

b<sub>6</sub>) reacting the (partially) neutralized polyurethane prepolymer dispersion from stage b<sub>5</sub>) with 3 to 60 parts by weight of a chain extender component (G) and also, subsequently or simultaneously, with 0 to 30 parts by weight of a chain stopper component (H).

63. (previously presented) The process of claim 62, wherein in reaction stage a<sub>1</sub>) component (B)(i) is metered into component (A)(i), or component (A)(i) is metered into component (B)(i).

64. (previously presented) The process of claim 62, wherein reaction stages a<sub>1</sub>) and a<sub>2</sub>) are carried out at a temperature of 10 to 30°C.

65. (previously presented) The process of claim 62, wherein reaction stages b<sub>1</sub>), b<sub>2</sub>) and b<sub>3</sub>) are carried out at a temperature of 60 to 120°C.

66. (previously presented) The process of claim 62, wherein reaction stages b<sub>4</sub>) and b<sub>5</sub>) are carried out at a temperature of 40 to 60°C.
67. (previously presented) The process of claim 62, wherein reaction stage b<sub>6</sub>) is carried out at 30 to 50°C.
68. (previously presented) The process of claim 62, wherein following reaction stage b<sub>6</sub>) any free NCO groups still present are completely chain-extended with water.
69. (previously presented) A liquid or pasty construction product comprising the polyurethane dispersion of claim 40, wherein the product is in the form of
- (a) synthetic resin plasters,
  - (b) bitumen compounds and asphalt, and
  - (c) individual components of external insulation and finishing systems,
- optionally with the addition of mineral binders.
70. (previously presented) A mineral construction products, in the form of
- (a) mortar additive dispersions for screeds, trowel-applied flooring compounds, and leveling components,
  - (b) mortar additive dispersions for construction adhesives, tile adhesives and EIFS adhesives,

- (c) dispersions as mortar additives for 2-component grouts,
- (d) mortar additive dispersions for concrete repair systems, and
- (e) polymer dispersions as additives in concrete construction work.

71. (currently amended) A formulation comprising the polymer dispersion of claim 40, for sport floor covering or tennis court surfacing, in the form of

- (a) binders for elastic layers, composed of rubber granules or of fibers with or without adjuvants,
- (b) adhesion promoters or primers for the base surfaces of sport floor coverings,
- (c) spray coatings, with or without texturing fillers, for application to rigid or elastic base surfaces,
- (d) leveling coatings for application to rigid or elastic base surfaces,
- (e) troweling compounds for sealing the pores of rigid or elastic base surfaces,
- (f) adhesives for bonding prefabricated elastic layers,
- (g) sealer coatings, with or without pigments, and
- (h) line paints ~~paints, comprising the polyurethane polymers of claim 40.~~

72. (previously presented) A formulation comprising the polyurethane dispersion of claim 40, optionally comprising mineral binders, for crack-bridging coating systems, in the form of

- a) prime, float or top layers, and also spray coatings or sealer coatings on preferably primed surfaces of built structures,
- b) (optionally flame-retarded) roof coatings or roof-painting materials, and
- c) (optionally flame-retarded) seals for built structures in opencast or underground mining.

73. (previously presented) A cement-based, aqueous high-build coating comprising the polyurethane dispersion of claim 40 as a binder.

74. (previously presented) A coating, sealant, printing ink, paint, varnish, primer, adhesive, membrane for a surface of mineral building material, such as concrete, gypsum, ceramic, clay, and cement, and also for the surfaces of glass, rubber, wood and woodbase materials, plastic, metal, paper, and composites, comprising the polyurethane dispersion of claim 40.

75. (currently amended) A composition for coating of ~~comprising~~ a real leather, a synthetic leather, a paper article or a cardboard ~~article~~ article, said composition containing the polymer dispersion of claim 40.

76. (previously presented) A composition comprising the polyurethane dispersion of claim 40 in one-, two- or multi-component form, and further components comprising formulating ingredients or hardeners.

77. (previously presented) A composition comprising the polyurethane dispersion of claim 40 and a formulating ingredient and, optionally, further polymers in the form of redispersible powders.

78. (currently amended) The composition of claim 76, wherein the polyurethane dispersion is present in an amount of 0.5% to 75% by weight, based on the composition.